

**What is Claimed is:**

1. A computer controlled automatic soldering machine comprising:

a heater to provide heat to a quantity of solder wire and to parts in a soldering position for soldering; and

means to move said heater and solder wire into the soldering position, wherein controls and mechanisms for a complete cycle sequence are not manually adjustable by a machine operator or by a production setup person.

2. Apparatus according to claim 1, wherein mechanisms for moving the heater and solder wire are actuated by cams.

3. Apparatus according to claim 2, further comprising: various adjustments which may be controlled by a machine operator, a production setup person, or a computer.

4. Apparatus according to claim 3, wherein said means to move said heater into the soldering position includes a pivot mounted frame for supporting a heater assembly.

5. An apparatus for soldering comprising: a solder wire feeder having a rigid guide rail with an axial groove for nesting and guiding solder wire, and

an oscillating bar positioned over the rail which supports a sharp point for engaging the solder wire as required for a forward feed motion.

6. Apparatus according to claim 5, wherein the rigid guide rail has a front end positioned within about 16 diameters of a solder wire diameter

from a solder tip, and wherein the front end of the guide rail contains a biasing device which holds the solder wire within the groove.

7. An oil pouch for applying a coat of oil on solder wire and the like, the oil pouch comprising:

an oil filled, open pore sponge elastomer contained within a sealed plastic bag, wherein the pouch is used on an in-line soldering system and is by pierced through for allowing soldering wire to pass through the bag and sponge.

8. A soldering machine comprising:

a heated metal tip; and

means to periodically position the tip for a soldering operation, wherein the metal tip can be periodically heated to various temperatures at a rate of 0.75 seconds or less, within a range of about 500°F to 700°F, and can be cooled to various temperatures at a rate of about 1.5 seconds or less within a range of about 700°F to 500°F.

9. Apparatus according to claim 8, wherein a means to heat the metal tip is an electrical current of at least about 300 amperes.

10. Apparatus according to claim 9, wherein the electrical current is alternating at a frequency between about 10 and 100 Hertz.

11. Apparatus according to claim 10, wherein a short pulse of the electrical current is applied to the tip simultaneously with removal of the tip away from a soldered part or parts.

12. Apparatus according to claim 8, wherein the metal tip comprises:

one or more wire entrance holes capable of receiving a portion of solder wire that is about 0.125 inches in diameter or less; and

one or more intersecting holes to allow exit of molten solder onto a part or parts to be soldered, wherein the one or more wire entrance holes has a properly designed shape, dimension, material, temperature, a controlled solder wire feed rate, and force to prevent molten solder and/or flux from ejecting out of the one or more wire entrance holes.

13. Apparatus according to claim 12, wherein a means to heat the metal tip is an electrical current of at least about 300 amperes, and is alternating at a frequency between about 10 and 100 Hertz.

14. An apparatus for soldering comprising:  
a heated solder tip; and

a solder wire feeder wherein said solder tip is at a relatively constant temperature and has one or more holes to receive a portion of solder wire that is about 0.125 inches in diameter or less, and has one or more intersecting holes to allow exit of molten solder onto a part to be soldered, and wherein the one or more holes are of a properly designed shape, dimension, material, temperature, a controlled solder wire feed rate, and force to prevent molten solder and/or flux from ejecting out of an entrance of the one or more holes.